Remarks

The above Amendments and these Remarks are in reply to the Office Action mailed August 29, 2001.

Currently, claims 11-142 are pending.

I. Rejections of Existing Claims

Claims 11-99 have been rejected under 35 U.S.C. § 103(a), as being obvious in view of *Moezzi et al.* (U.S. Patent No. 5,850,352). Because *Moezzi et al.* does not disclose, teach or suggest all of the limitations of Applicants' claims, Applicants respectfully assert that the currently pending claims are in condition for allowance.

A telestrator system " is a system that allows an operator to draw on live or stored video." (Specification at page 2). Various embodiments of Applicants' invention pertains to an:

> improved telestrator system that allows a broadcaster or other operator to annotate video during or after an event. For example, while televising a sporting event (or other type of event), an announcer (or other user) can use the present invention to draw over the video of the event to highlight one or more actions, features, etc. In one embodiment, when the user draws over the video it appears that the user is drawing on the actual field or location of the event. (Specification at page 4).

For example:

> In operation, a user of the system can use a finger on touch screen 104 to draw a graphic (e.g. shape or curve). Information about what is being drawn is sent to telestration processor 108. The resulting blend of the graphic with the video is sent back to display 102. (Specification at page 8).

In another example, a pre-defined shape can be added to the video instead of a hand drawing:

> Examples of highlights could include a cloud, a hollow circle, icons, team logos, bright spots, etc. The user interface could allow the operator to choose the appropriate highlight. In operation, the one touch highlight can be performed by the operator touching the screen once quickly. Upon sensing the

quick touch, the system will add the pre-chosen highlight to the video at the touched position. (Specification at page 34).

In addition to a telestrator system, Applicants' invention can pertain to other systems for adding images to video.

One embodiment of the present invention allows a user of the system to add an image to the video such that the image appears to be drawn directly on a surface of the scene being depicted in the video:

> For example, during an American football game, if a user draws on the video it appears that the user is actually drawing on the playing field. After the user draws the illustration, the drawing will appear to be painted on the playing field so that if the camera moves or the broadcaster changes cameras the drawing still appears on the playing field in the appropriate perspective. This feature is depicted in Figures 3 and 4. Figure 3 shows a video frame 16 which is broadcast as a result of using the present invention. The operator had drawn an arrow 12 to show the path of a player or object on the playing field. Figure 4 shows a video frame 18 which is also the result of using the present invention. However, Figure 4 shows arrow 12 at a different position in frame 18 than in frame 16. That is because after the user had drawn arrow 12 and it was depicted in frame 16, the camera panned down the playing field. Instead of being pointed between the 20 and 15 yard lines, the camera is now pointed directly at the 20 yard line and, thus, the 25 yard line is now visible. Because the field moved within the camera's field of view, the location of arrow 12 also moved within the camera's field of view. Arrow 12 now appears to be drawn directly on the playing field as opposed to on the television monitor. As the field moves on the video screen, arrow 12 will also move. (Specification at page 7).

Claim 11 recites various aspects of the present invention. For example, claim 11 recites:

> 11. A method for annotating video, comprising the steps of:
>
> receiving video, said video depicts a surface at a live event;
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> receiving a graphic manually created by a human operator during said live event; and
>
> blending said graphic with said video such that said graphic appears to be drawn on said surface, said step of blending being performed during said live event.

The cited prior art does not disclose receiving a graphic that is "manually created by a human operator during said live event..." Additionally, the cited prior art does not blend a graphic "such that said graphic appears to be drawn on said surface" as described in the above quotation from the specification.

Moezzi et al. discloses a system that provides for:

> telepresence and immersive video, being the non-real-time creation of a synthesized, virtual, camera/video image of a real-world scene, typically in accordance with one or more viewing criteria that are chosen by a viewer of the scene. The creation of the virtual image is based on a computerized video processing--in a process called hypermosaicing--of multiple video views of the scene, each from a different spatial perspective on the scene. (*Moezzi et al.*, col. 9, lines 10-18).
>
> In one of its aspects, the present invention is embodied in a method of telepresence, being a video representation of being at real-world scene that is other than the instant scene of the viewer. The method includes (i) capturing video of a real-world scene from each of a multiplicity of different spatial perspectives on the scene, (ii) creating from the captured video a full three-dimensional model of the scene, and (iii) producing, or synthesizing, from the three-dimensional model a video representation on the scene that is in accordance with the desired perspective on the scene of a viewer of the scene. (*Moezzi et al.*, col. 9, lines 47-57)
>
> This method is thus called "immersive telepresence" because the viewer can view the scene as if immersed therein, and as if present at the scene, all in accordance with his or her desires. Namely, it appears to the viewer that, since the scene is presented as the viewer desires, the viewer is immersed in the scene. Notably, the viewer-desired perspective on the scene, and the video representation synthesized in accordance with this viewer-desired perspective, need not be in accordance with any of the video captured from any scene perspective. (*Moezzi et al.*, col. 9, lines 58-67).

To help understand the technology, *Moezzi et al.* provides an example of its use:

> In the example of an American football game, the viewer/user could view the game in progress as if he or she was a player "inside" the game, even to the extent of looking "outward" at the stadium spectators. (*Moezzi et al.*, col. 16, lines 20-25) ...
>
> A viewer interface is responsive to a viewer of the scene to receive a viewer selection of a desired view on the scene. This selected and desired view need not be identical to any views

> that ar[redacted]ithin any of the multiple received vid[redacted]images ... a visualizer generates (alternatively, "synthesizes") (alternatively "extracts") from the three-dimensional model of the scene, and in accordance with the received desired view, a video image on the scene that so shows the scene from the desired view. (*Moezzi et al.*, col. 20, lines 30-39)

As can be seen, *Moezzi et al.* pertains to a system that can create piece together video from different cameras of a real world scene to create a new view of that real world scene based on the video from different cameras. The invention of *Moezzi et al.* is not focused on annotating video, adding a new graphic drawn by a human to the video or adding a graphic so that it appears to be drawn on the surface. As such, *Moezzi et al.* does not disclose or teach all of the limitations of claim 11.

In the office action, the Examiner states that Figures 9a-9c of *Moezzi et al.* disclose the step of "receiving a graphic manually created by a human operator." However, a review of those figures in *Moezzi et al.* reveal otherwise. That is, Figures 9a, 9b and 9c depict a graphical rendition of the 3D environment model. These figures do not show drawings created by a human operator. Figure 9a does show a person as a low resolution cylinder like object:

> People in the scene are detected and modeled as cylinders in our current implementation as shown in Fig. 9a. (*Moezzi et al.*, col. 45, lines 26-29).

The cylinder referred to in the above quotes and depicted in Fig. 9a is not disclosed to be a graphic manually created by a human operator. Rather, it appears to be a computer rendered low resolution image of a person at the scene. A similar analysis applies to Figs. 9b and 9c:

> FIG. 9b is a graphical rendition of the full 3D environment model generated by the environmental model builder of the immersive video system of the present invention for an indoor karate demonstration as was previously shown in FIG. 4, the two human participants being clothed in karate clothing with a kick in progress, the scale and the resolution of the model being clearly observable.
>
> FIG. 9c is another graphical rendition of the full 3D environment model generated by the environmental model builder of the immersive video system of the present invention, this time for an outdoor karate demonstration, this time the environmental model being further shown to be located in the

static [redacted]e, particularly of an outdoor courtyar[redacted] *Moezzi et al.*, col. 21, lines 20-34).

Therefore, Figs 9a-9c do not show a graphic drawn by a human operator.

The Examiner also states that Figs 9a-9c of *Moezzi et al.* disclose blending the graphic with the video. First, as discussed above, of *Moezzi et al.* does not disclose blending a graphic drawn by a human. Second, Figs. 9a-9c of *Moezzi et al.* do not disclose blending a graphic at all. The fuzzy image in those figures is an actual person at the scene, not a new image to be added to the video. Furthermore, Figs 9a-9c represent models of the environment, they are not the final video.

Applicants also note that the Examiner does not provide evidence that all of the limitation of claim 11 are obvious in light of *Moezzi et al.* That is, the Examiner quotes the last step as "blending said graphic with said video." However, the last step of claim 11 also recites the language: "such that said graphic appears to be drawn on said surface." This additional language is not addressed by the Examiner. Applicants assert that *Moezzi et al.* does not disclose the blending of a video "such that said graphic appears to be draw on said surface." Rather, as explained above, *Moezzi et al.* discloses the creation of a virtual image based on real images. One example in Applicant's specification of blending such that the graphic appears to drawn on the surface is the arrow depicted as painted on the field in Figs 3 and 4. As the camera pans, the arrow moves with the field giving the illusion that the arrow is painted on the field. This concept is not taught or suggested by *Moezzi et al.*

For all of the reasons discussed above, Applicants respectfully assert that claim 11 and all claims that depend from claim 11 are patentable over the cited prior art.

Claim 33 recites the step of "receiving a graphic manually created by a human operator..." Thus, for the same reasons as discussed above with respect to claim 11, Applicants assert that claim 33 and all claims that depend from claim 33 are patentable over the cited prior art. Claim 33 also recites that at least a portion of the surface captured in the video is occluded and that the graphic is blended without drawing over the object that is occluding the surface. This concept is not taught or suggested by *Moezzi et al,* nor has this limitation been addressed by the Examiner; therefore, providing another basis for patentability. For all of the reasons discussed above, Applicants assert that claim 33, and all claims that depend from claim 33, are patentable over the cited prior art.

Claim 42 recites the steps of receiving two dimensional position information for a graphic, converting two dimensional positions to three dimensional positions and converting

the three dimensional positions to two dimensional positions. This process is not disclosed or suggested by *Moezzi et al.* Applicants assert that the Examiner has not made a *prima facie* case of obviousness for claim 42 because the Examiner did not address the above mentioned limitations regarding converting. Therefore, Applicants assert that claim 42, and all claims that depend from claim 42, are patentable over the cited art.

Claim 53 recites the receiving of a drawing manually created by a human. Thus, claim 53 is patentable for the respective reasons discussed above with respect to claim 11. Claim 53 also recites the step of "smoothing said drawing." This step of smoothing is not taught or suggested by *Moezzi et al.*. Applicants assert that the Examiner has not made a *prima facie* case of obviousness for claim 53 because the Examiner did not address the above mentioned limitations regarding smoothing. Therefore, Applicants assert that claim 53, and all claims that depend from claim 53, are patentable over the cited art.

Claim 56 recites a series of steps that are used to blend images using blending values. There is no disclosure in *Moezzi et al.* to blend images using such blending values. Applicants assert that the Examiner has not made a *prima facie* case of obviousness for claim 56 because the Examiner did not address the above mentioned limitations regarding blending values. Therefore, Applicants assert that claim 56, and all claims that depend from claim 56, are patentable over the cited art.

Claim 69, and all claims that depend from claim 69, are patentable over *Moezzi et al.* for similar reasons to those discussed above with respect to claim 56.

Claim 79, and all claims that depend from claim 79, are patentable over *Moezzi et al.* for similar reasons to those discussed above with respect to claim 11.

Claim 85, and all claims that depend from claim 85, are patentable over *Moezzi et al.* for similar reasons to those discussed above with respect to claim 33.

Claim 92, and all claims that depend from claim 92, are patentable over *Moezzi et al.* for similar reasons to those discussed above with respect to claim 98.

Claim 98, and all claims that depend from claim 98, are patentable over *Moezzi et al.* for similar reasons to those discussed above with respect to claim 53.

II. New Claims

Applicants have added new claims 100-142. Claims 100, 115 and 124 are independent claims. Claim 100 recites the steps of "manually adding a graphic to said video during said live event; and maintaining said graphic in said video such that said graphic

appears to be drawn on said surface." As discussed above with respect to claim 11, *Moezzi et al.* does not disclose or suggest the adding a graphic to a video such that the graphic appears to be drawn on said surface. Claims 101 –142 are patentable for similar reasons.

III. Information Disclosure Statements

On October 21, 1999, when filing the present application, Applicant filed an IDS. A copy of that IDS is attached as Exhibit A to this Response. Attached as Exhibit B to this Response is a copy of a postcard received from the United States Patent and Trademark Office ("PTO") acknowledging receipt of the IDS and the cited prior art references.

Applicants have not received the form PTO-1449 from the Examiner, acknowledging that the Examiner considered the cited prior art. Applicants assert that the Examiner has a duty to consider the cited prior art and return a copy of the form PTO-1449 to the Applicants. Therefore, Applicants respectfully request that the Examiner send to Applicants a copy of the initialed PTO-1449 acknowledging that the Examiner considered the cited prior art.

In paragraph 1 of the Office Action, the Examiner acknowledged that a second IDS submitted on February 12, 2001 is missing from the file. Attached to this Response as Exhibit C is a copy of the IDS submitted on February 12, 2001. Attached to this Response as Exhibit D is a copy of the postcard received from the USPTO acknowledging receipt of the IDS and the references cited in the IDS. Applicants respectfully request that the Examiner send to Applicants a copy of the initialed PTO-1449 acknowledging that the Examiner considered the cited prior art.

IV. Amendments Do Not Effect Patentability

Applicants added new claims 100-142 to more sufficiently cover additional embodiments. The addition of these new claims is not related to the patentability of claims 11-99.

Applicants made minor amendments to claims 11, 15, 33, 35, 43, 56, 62, 65, 66, 69, 72, 76, 79, 85, 87, 92, and 98. These amendments are not related to patentability, and are not presented in response to a rejection. Rather, they correct typographical errors. For example, the amendments to claims 11 and 33 changed "said" to –a--, which is not in response to any rejection from the Examiner. The amendment to claim 15 changed ""a" to –said-, which is not in response to any rejection from the Examiner. The amendments to claims 35 and 87 change "blending values" to -a first blending value-, which is not in response to any rejection.

The amendments to claims 43, 62, 66, 66, 72 and 76 fix a typo and do not address any rejections. The amendments to claims 79, 85, 92, and 98 changed "processors programmed to perform" to –one or more processors perform–, which is not in response to any rejection from the Examiner and broadens the claims. Claims 56 and 69 were slightly reworded to cover embodiments determined to be valuable to Applicants. The amendments to claims 56 and 69 are is not in response to any rejection from the Examiner. The remarks submitted to demonstrate the claims 56 and 69 are patentable apply to both the original claims and the amended claims because both the original claims and the amended claims are patentable over the cited prior art.

CONCLUSION

In view of the above Amendments and Remarks, reconsideration of claims 11-99 is requested. Consideration of newly added claims 100-142 is also requested.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 501826 for any matter in connection with this Response, including any fee for extension of time, which may be requested.

Respectfully submitted,

Date: December 17, 2001 By: _____

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APPENDIX

11. (once amended) A method for annotating video, comprising the steps of:

receiving video, said video depicts a surface at [said] a live event;

receiving a graphic manually created by a human operator during said live event; and

blending said graphic with said video such that said graphic appears to be drawn on said surface, said step of blending being performed during said live event.

15. (once amended) A method according to claim 11, wherein:

prior to said step of blending, at least a portion of said video depicts at least a portion of said surface at [a] said live event and a set of one or more objects occluding said surface; and

said step of blending includes blending said graphic with said portion of said video without drawing said graphic over said objects.

33. (once amended) A method for annotating video, comprising the steps of:

receiving video, at least a portion of said video depicts at least a portion of a surface at a live event and a set of one or more objects occluding said surface;

receiving a graphic manually created by a human operator during said live event; and

blending [a] said graphic with said portion of said video without drawing said graphic over said objects, said steps of receiving video, receiving a graphic and blending are performed during said live event.

35. (once amended) A method according to claim 34, further comprising the steps of:

receiving a selection of a portion of an image, said portion of said image includes a set of colors;

receiving [said] a first blending value[s] for said set of colors; and

storing said first blending values.

43. (once amended) A method according to claim 42, further comprising the steps of:

receiving camera sensor data for a first camera, said video being captured by said first camera, said step of converting said one or more three dimensional locations to a second set of one or more two dimensional positions is performed [uses] using said camera sensor data for said first camera.

56. (once amended) A method for blending images, comprising the steps of:

storing blending values for a set of colors;

receiving a first image [after said step of storing];

receiving a second image after said step of storing;

accessing color data for said second image;

comparing said color data to said [blending values for said] set of colors; and

causing a blending of said first image with said second image based on using [said] one or more blending values for [said set of colors.] colors of said set of colors that match said color data for said second image.

62. (once amended) A method according to claim 56, wherein:

said steps of accessing and comparing include the steps of:

accessing a first pixel in said second image, said first pixel having a first color value,

accessing additional pixels nearby to said first pixel in said second image, said additional pixels having additional color values,

comparing a first color value for said first pixel to a color map, said color map stores color values for said set of colors and said blending values for said set of colors,

comparing said additional color values to said color map,

identifying a first blending value corresponding to said first color value based on said color map,

identifying additional blending values corresponding to said additional color values based on said color map,

calculating an average of said first blending value and said additional blending values, and

adjusting said average based on a weighting factor; and

said step of causing a blending includes using said adjusted average to blend said first pixel with a corresponding pixel in said first image.

65. (once amended) A method according to claim 56, wherein:

said set of colors includes multiple visibly distinct colors.

66. (once amended) A method according to claim 56, wherein:

said step of accessing color data includes accessing color data for a first portion of said second image, said first portion of said second image corresponds in position to said first image; and

said step of causing a blending includes causing said first image to be blended with said first portion of said second image and not other portions of said second image.

69. (once amended) An apparatus, comprising:

one or more processors;

an input device in communication with said one or more processors;

an output device in communication with said one or more processors; and

at least one storage device in communication with said one or more processors, said one or more processors [programmed to preform] perform a method comprising the steps of:

storing blending values for a set of colors,

receiving a first image,

receiving a second image,

accessing color data for said second image,

comparing said color data to [said blending values for] said set of colors, and

causing a blending of said first image with said second image based on using [said] one or more blending values for [said set of colors.] colors of said set of colors that match said color data for said second image.

72. (once amended) An apparatus according to claim 69, wherein:

said steps of accessing and comparing include the steps of:

accessing a first pixel in said second image, said first pixel having a first color value,

accessing additional pixels nearby to said first pixel in said second image, said additional pixels having additional color values,

comparing a first color value for said first pixel to a color map, said color map stores color values for said set of colors and said blending values for said set of colors,

comparing said additional color values to said color map,

identifying a first blending value corresponding to said first color value based on said color map,

identifying additional blending values corresponding to said additional color values based on said color map,

calculating an average of said first blending value and said additional blending values, and

adjusting said average based on a weighting factor; and

said step of causing a blending includes using said adjusted average to blend said first pixel with a corresponding pixel in said first image.

76. (once amended) An apparatus according to claim 69, wherein:

said step of accessing color data includes accessing color data for a first portion of said second image, said first portion of said second image corresponds in position to said first image; and

said step of causing a blending includes causing said first image to be blended with said first portion of said second image and not other portions of said second image.

79. (once amended) An apparatus, comprising:

one or more processors;

a drawing device in communication with said one or more processors;

an output device in communication with said one or more processors; and

at least one storage device in communication with said one or more processors, said one or more processors [programmed to preform] perform a method comprising the steps of:

receiving video, said video depicts a surface at [said] a live event,

receiving a graphic manually created by a human operator during said live event, and

causing a blending of said graphic with said video such that said graphic appears to be drawn on said surface, said step of blending being performed during said live event.

85. (once amended) An apparatus, comprising:

one or more processors;

a drawing device in communication with said one or more processors;

an output device in communication with said one or more processors; and

at least one storage device in communication with said one or more processors, said one or more processors [programmed to preform] perform a method comprising the steps of:

receiving video, at least a portion of said video depicts at least a portion of a surface at a live event and a set of one or more objects occluding said surface,

receiving a graphic manually created by a human operator during said live event, and

causing a blending of a graphic with said portion of said video without drawing said graphic over said objects, said steps of receiving video, receiving a graphic and causing are performed during said live event.

87. (once amended) An apparatus according to claim 86, wherein said method further includes the steps of:

receiving a selection of a portion of an image, said portion of said image includes a set of colors;

receiving [said] a first blending value[s] for said set of colors; and

storing said first blending value[s].

92. (once amended) An apparatus, comprising:

one or more processors;

a drawing device in communication with said one or more processors;

an output device in communication with said one or more processors; and

at least one storage device in communication with said one or more processors, said one or more processors [programmed to preform] perform a method comprising the steps of:

receiving video, said video depicts a surface at said live event,

receiv[redacted][a] two dimensional position inform[redacted] for at least a portion of a graphic created in relation to a two dimensional image,

converting a first set of one or more two dimensional positions to one or more three dimensional locations, said first set of one or more two dimensional positions correspond to said two dimensional position information,

converting said one or more three dimensional locations to a second set of one or more two dimensional positions, and

causing a blending of said graphic with said video based on said second set of one or more two dimensional positions.

98. (once amended) An apparatus, comprising:

one or more processors;

a drawing device in communication with said one or more processors;

an output device in communication with said one or more processors; and

at least one storage device in communication with said one or more processors, said one or more processors [programmed to preform] perform a method comprising the steps of:

receiving video, said video depicts a surface at said live event,

receiving at least a portion of a drawing manually created by a human operator during said live event,

smoothing said drawing, and

blending said smoothed drawing with said video during said live event.